

NRA THAMES REGION
KENNET CATCHMENT
TIME OF TRAVEL STUDIES
FINAL REPORT

Contract No. C30020

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NRA Thames 140.



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Hargreaves Road, Groundwell Industrial Estate, Swindon, Wiltshire, SN2 5AZ

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Originator:	Andrew FitzGerald Senior Environmental Scientist	<i>D Stewart</i>	June 1995
Checked & Approved:	Mark Hannam Operations Manager, Environmental Sciences	<i>Rachel Stewart</i>	June 1995

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EXECUTIVE SUMMARY

Wimpey Environmental Ltd was contracted by NRA Thames Region to undertake Time of Travel studies within the Kennet catchment between Marlborough and Reading under low, medium and high flow conditions. The River Kennet, River Lambourn, River Enborne and the Holy Brook were divided into a total of 23 sections bounded by fixed dye injection and monitoring points. The conservative dye tracer rhodamine WT was introduced at the injection point and measured at the monitoring point using a fluorimeter to detect the first arrival and peak arrival times of the dye.

Dye releases were conducted in line with NRA guidance in order to minimise the potential impact upon the water intake at Fobney and river users. Although some aesthetic difficulties were encountered in the early stages of the survey, where dye concentration levels were still visible some distance from the injection point, in general most peak dye concentrations at the monitoring points were less than 15µg/l. During the sensitive summer periods the majority of dye peaks were less than 5µg/l.

Work was conducted between June 1994 and May 1995. Time of travel data for low flow conditions were collected in autumn 1994. Data for medium flow conditions were obtained throughout the contract period, with 14 sections undertaken in the summer of 1994, 4 sections in December 1994 and the remaining 5 sections in May 1995. The high flow data were recorded in the winter of 1994/95.

This final data report provides a concise overview of the data generated by the study. Details of the methods employed, the dye release programme and the time of travel data plots may be found in the data reports for each flow condition [1] [2] [3].

1. INTRODUCTION

1.1 SURVEY AREA

The River Kennet and its tributaries (the Holy Brook, the River Enborne and the River Lambourn) form a total river length of about 112km between Marlborough and the River Kennet's confluence with the River Thames at Reading. Figure 1 shows the Kennet catchment survey area and the breakdown of the river length into 23 time of travel study sections. Table 1 provides a listing of the sections studied and the locations of the injection and monitoring points.

1.2 FLOW CRITERIA

The principal requirement of the contract was to undertake time of travel studies for all 23 sections under low, medium and high flow conditions. The various flow conditions were defined on the basis of flow percentiles as follows:

FLOW CONDITION	HIGHER BOUNDARY (%ILE)	UPPER BOUNDARY (%ILE)
Low	0	25
Medium	37.5	62.5
High	75	100

Six gauging stations throughout the Kennet catchment were used to provide flow data from which the flow conditions and dye volumes used in this survey were calculated. Four of the gauging stations were on the River Kennet (Theale, Newbury, Knighton and Marlborough), one station was on the River Enborne (Brimpton) and one station was located on the River Lambourn (Shaw). Table 2 lists the flow boundary criteria for each of the gauging stations.

Table 3 provides the flow ratios for each river section relative to the nearest gauging stations, and gives an indication of the preferred station's gauging data to be applied to each section. Owing to the varying geology of the study area, different tributaries exhibited a different response to rainfall in terms of both reaction time and the level of flow. The gauging station data were used to ascertain when specific sections of the catchment were within the required flow conditions. The data were also used to calculate the required quantity of dye at the injection point in proportion to the level of flow.

2. METHODOLOGY

Details of the programme logistics, the dye mass calculations, the instrumentation and its deployment, the dye injection methodology, health and safety, and data analysis are all presented in the low, medium and high data reports [1] [2] [3].

3. RESULTS

Time of travel data were obtained for each section of the Kennet catchment under low, medium and high flow conditions, as detailed below:

FLOW CONDITION	DATES	NUMBER OF SECTIONS	REACH SUBDIVISION
Low Flows	26/08/94-11/10/94	25	K3 into 3 subsections
Medium Flows	15/06/94-10/08/94	18	K3 into 3 subsections & K14 into 3 subsections
	09/12/94-13/12/94	4	
	10/05/95-15/05/95	5	
High Flows	08/12/94	2	
	31/01/95-01/03/95	23	K3 into 3 subsections

The data supplied are listed in Tables 4a, 4b and 4c for low, medium and high flow conditions respectively. The first arrival and peak arrival times of travel and the calculated velocity for each section are shown alongside the relevant flow gauging data. The data have been presented in geographical rather than chronological sequence, moving upstream from Reading. A description of the section codes may be found in Table 1.

Peak and background dye levels have been obtained from the data listing and have been rounded up to the nearest 0.01ug/l, although it is stressed that this is not the implied accuracy. Times provided are in decimal hours for consistency with the data listing. Peak concentrations in Table 4 have been derived by subtracting background levels. The dye mass injected has been calculated from the dye volume added, assuming a 20% by weight solution and a density of 1.2 g/cm³.

A comparison between the time of travel data for the three flow conditions reveals two key features:

1. A significant variation in velocity is experienced throughout the Kennet catchment.
2. Velocities under high flow conditions are considerably faster than low and medium flow conditions.

The large variation in flow velocities throughout the catchment can be attributed to the complex association between the River Kennet and the Kennet and Avon Canal. Where the two water courses intertwine throughout the survey area, it would seem that they give rise to a number of slow and fast flowing sections. It would seem that flow velocities are further complicated by river level control in both the River Kennet and the Kennet and Avon Canal by boards and possibly even by the level of weed cut back on the channel bed.

The notably faster flow velocities under high flow conditions may be explained by the very high flows that were encountered for many of the sections studied. In extreme cases, such as the upper River Enborne, there is an indication that the river may have overspilt its bank, further complicating interpretation.

4. REFERENCES

- [1] Wimpey Environmental Ltd (December 1994). *Kennet Catchment Time of Travel Studies: Low Flow Data Report*. Report to NRA Thames Region.
- [2] Wimpey Environmental Ltd (August 1994). *Kennet Catchment Time of Travel Studies: Medium Flow Preliminary Data Report*. Report to NRA Thames Region.
- [3] Wimpey Environmental Ltd (March 1995). *Kennet Catchment Time of Travel Studies: High Flow Data Report*. Report to NRA Thames Region.

TABLES

RIVER	SECTIONS	SECTION CODE	SECTION LENGTHS	RELEASE NGR	MONITORING NGR
Kennet	Berkley Avenue to Thames Confluence	K1	2.41	SU 7140 7260	SU 7310 7380
Kennet	Fobney WTW to Berkley Avenue	K2	2.64	SU 7050 7100	SU 7140 7260
Kennet	Burghfield Bridge to Fobney WTW	K3	3.52	SU 6820 7080	SU 7050 7100
Kennet	River Weir to Fobney WTW	K3A	0.63	SU 6990 7115	SU 7050 7100
Kennet	Overspill boards to River Weir	K3B	1.63	SU 68507090	SU 6990 7115
Kennet	Burghfield Bridge to overspill boards	K3C	1.26	SU 6820 7080	SU 6850 7090
Kennet	Theale G Stn to Burghfield Bridge	K4	3.85	SU 6490 7080	SU 6820 7080
Kennet	Ulfon Bridge to Theale G Stn	K5	4.54	SU 6180 6862	SU 6490 7080
Kennet	Enborne Confluence to Ulfon Bridge	K6	5.28	SU 5920 6610	SU 6180 6862
Kennet	Kings Bridge to Enborne Confluence	K7	4.78	SU 5550 6560	SU 5920 6610
Kennet	Thatcham to Kings Bridge	K8	3.59	SU 5270 6620	SU 5550 6560
Kennet	Ham Bridge to Thatcham	K9	4.99	SU 4910 6730	SU 5270 6620
Kennet	Marsh Benham to Ham Bridge	K10	7.82	SU 4230 6700	SU 4910 6730
Kennet	Kintbury to Marsh Benham	K11	4.43	SU 3850 6740	SU 4230 6700
Kennet	Knighton G Stn to Kintbury	K12	12.52	SU 2894 7118	SU 3855 6740
Kennet	Mildenhall to Knighton G Stn	K13	9.65	SU 2140 6960	SU 2894 7118
Kennet	Marlborough G Stn to Mildenhall	K14	3.76	SU 1870 6860	SU 2140 6960
Kennet	Tile Factory to Mildenhall	K14A	1.5	SU 2030 6920	SU 2140 6960
Kennet	Petrol Station to Tile Factory	K14B	1.5	SU 1920 6905	SU 2030 6920
Kennet	Marlborough G Stn to Petrol Station	K14C	0.75	SU 1870 6860	SU 1920 6905
Holy Brook	Burghfield Road to Kennet Confluence	H1	3.6	SU 6830 7138	SU 7200 7350
Holy Brook	Theale to Burghfield Road	H2	4.1	SU 6560 7085	SU 6830 7138
Enborne	Brimpton G Stn to Kennet Confluence	E1	3.77	SU 5680 6480	SU 5900 6610
Enborne	Hyde End to Brimpton G Stn	E2	3.48	SU 5530 6340	SU 5680 6480
Enborne	Thornford Road to Hyde End	E3	3.8	SU 5210 6380	SU 5530 6340
Enborne	Bishops Green to Thornford Road	E4	2.95	SU 5010 6350	SU 5210 6380
Enborne	Newbury A343 to Bishops Green	E5	6.65	SU 4530 6330	SU 5010 6350
Lambourn	Bagnor to Kennet Confluence	L1	4.78	SU 4530 6915	SU 4860 6745
Lambourn	Boxford to Bagnor	L2	5.48	SU 4268 7225	SU 4530 6910

TABLE 1. Kennet Catchment Sections

RIVER	GAUGING STATION	NGR	LOW FLOW 0-25%ILE (cumecs)	MEDIUM FLOWS 37.5-62.5%ILE (cumecs)	HIGH FLOWS 75-100%ILE (cumecs)
Kennet	Theale	SU 649708	< 5.37	6.68-10.195	> 12.4
Kennet	Newbury	SU 472672	< 2.23	2.50-3.86	> 4.51
Kennet	Knighton	SU 294710	< 1.1	1.5-2.695	> 3.49
Kennet	Marlborough	SU 187686	< 0.25	0.385-0.885	> 1.25
Enborne	Brimpton	SU 568647	< 0.31	0.495-1.05	> 1.42
Lambourn	Shaw	SU 469682	< 1.07	1.20-1.80	> 2.20

TABLE 2. Low, Medium and High Flow Boundary Criteria for the Kennet Catchment Gauging Stations

SECTION CODE	PROPORTION OF FLOW* AT:					
	BRIMPTON	SHAW	MARLBOROUGH	KNIGHTON	NEWBURY	THEALE
K1			6.4	3.8	1.8	1.0
K2			6.4	3.8	1.8	0.75
K3A						
K3B						
K3C						
K4			6.4	3.7	1.8	1.0
K5			6.3	3.7	1.7	1.0
K6			5.2	3.1	1.4	0.8
K7			5.1	3.0	1.4	0.8
K8			5.1	3.0	1.4	0.8
K9			5.0	2.9	1.4	0.8
K10			3.5	2.0	1.0	0.5
K11			3.2	1.9	0.9	0.5
K12			1.7	1.0	0.5	0.3
K13			1.5	0.9	0.4	0.2
K14			1.0	0.6	0.3	0.2
H1						0.25
H2						0.3
E1		1.0				
E2		0.8				
E3		0.7				
E4		0.6				
E5		0.5				
L1	0.8					
L2	0.7					

* For example, flow at K6 is assumed to be 0.8 x flow at Theale Gauging Station

Preferred ratio for each station

TABLE 3. Flow Ratios of Monitoring Points Relative to Gauging Stations

SECTION CODE	SECTION LENGTH (km)	FIRST ARRIVAL TIME (hours)	PEAK ARRIVAL TIME (hours)	FIRST ARRIVAL VELOCITY (Km/Hr)	PEAK ARRIVAL VELOCITY (Km/Hr)	FLOW AT GAUGING STATION (Cumecs) (Note 1)	DATE	BACKGROUND READING (µg/l)	PEAK READING (µg/l) (Note 2)	DYE MASS (g) (Note 3)
K1	2.41	3.30	4.19	0.73	0.58	5.27 (T)	26/08/94	0.55	1.9	79
K2	2.64	2.47	3.30	1.07	0.80	5.27 (T)	26/08/94	0.51	2.4	53
K3a	1.26	1.15	1.47	1.10	0.86	5.43 (T)	31/08/94	0.47	4.1	24
K3b	1.63	2.49	3.28	0.66	0.50	5.43 (T)	31/08/94	0.45	0.8	12
K3c	0.63	0.51	0.75	1.25	0.84	5.43 (T)	31/08/94	0.46	2.9	12
K4	3.85	3.90	4.92	0.99	0.78	4.94 (T)	06/09/94	0.40	3.0	77
K5	4.54	6.00	7.82	0.76	0.58	4.94 (T)	06/09/94	0.39	1.7	77
K6	5.28	5.03	6.18	1.05	0.85	4.91 (T)	07/09/94	0.57	2.3	77
K7	4.78	4.30	5.70	1.11	0.84	4.81 (T)	3-4/10/94	0.35	2.2	78
K8	3.59	2.92	3.54	1.23	1.01	4.73 (T)	04/10/94	0.38	3.3	60
K9	4.99	5.58	6.72	0.89	0.74	4.73 (T)	04/10/94	0.34	2.9	60
K10	7.82	12.69	18.32	0.62	0.43	2.46 (N)	4-5/10/94	0.33	0.7	60
K11	4.43	7.27	8.77	0.61	0.50	2.47 (N)	05/10/94	0.41	2.4	47
K12	12.52	23.41	28.07	0.53	0.45	1.16 (K)	5-7/10/94	0.25	1.8	144
K13	9.65	23.60	28.50	0.41	0.34	1.16 (K)	7-8/10/94	0.26	1.6	48
K14	3.76	7.95	10.05	0.47	0.37	0.218 (M)	10/10/94	0.32	0.7	4
H1	3.60	7.49	9.01	0.48	0.40	5.63 (T)	01/09/94	0.52	1.9	24
H2	4.10	6.84	8.30	0.60	0.49	4.87 (T)	05/09/94	0.35	3.2	22
E1	3.77	13.25	15.35	0.28	0.25	0.248 (B)	07/09/94	0.63	1.2	4
E2	3.48	8.22	10.37	0.42	0.34	0.271 (B)	02/09/94	0.82	2.1	4
E3	3.80	16.07	18.97	0.24	0.20	0.279 (B)	08/09/94	0.70	1.5	4
E4	2.95	7.64	9.65	0.39	0.31	0.327 (B)	12-13/9/94	0.88	2.7	4
E5	6.65	28.07	32.87	0.24	0.20	0.250 (B)	12-14/9/94	1.02	1.7	4
L1	4.78	5.68	7.01	0.84	0.68	1.1 (S)	06/10/94	0.26	0.7	14
L2	5.48	7.47	8.82	0.73	0.62	1.09 (S)	11/10/94	0.23	0.8	17

Note 1: (T) = Theale, (N) = Newbury, (K) = Knighton, (M) = Marlborough, (B) = Brimpton and (S) = Shaw

Note 2: Peak dye concentration following the subtraction of background levels.

Note 3: Assuming a 1.2g/cm³ density and a 20% solids (dye) content by weight.

TABLE 4a. Time of Travel Under Low Flow Conditions

SECTION CODE	SECTION LENGTH (km)	FIRST ARRIVAL TIME (hours)	PEAK ARRIVAL TIME (hours)	FIRST ARRIVAL VELOCITY (Km/Hr)	PEAK ARRIVAL VELOCITY (Km/Hr)	FLOW AT GAUGING STATION (Cumecs) (Note 1)	DATE	BACKGROUND READING (µg/l)	PEAK READING (µg/l) (Note 2)	DYE MASS (g) (Note 3)
K1	2.41	2.57	3.23	0.94	0.75	6.83 (T)	09/07/94	0.69	2.4	120
K2	2.64	2.05	2.68	1.29	0.98	6.83 (T)	09/07/94	0.62	4.6	120
K3a	1.26	0.62	0.78	2.02	1.61	8.56 (T)	15/06/94	0.71	5.3	34
K3b	1.63	1.43	1.94	1.14	0.84	8.56 (T)	15/06/94	0.71	0.3	5
K3c	0.63	0.45	0.70	1.40	0.91	8.56 (T)	15/06/94	0.71	3.1	12
K4	3.85	3.41	4.36	1.13	0.88	6.37 (T)	11/07/94	0.65	3.6	120
K5	4.54	4.70	6.50	0.97	0.70	6.37 (T)	11/07/94	0.56	1.7	120
K6	5.28	3.75	4.80	1.41	1.10	6.24 (T)	12/07/94	0.55	2.7	120
K7	4.78	2.83	3.32	1.69	1.44	10.70 (T)	15/05/94	0.87	3.6	60
K8	3.59	2.13	2.55	1.69	1.41	10.20 (T)	12/12/94	0.66	4.0	60
K9	4.99	3.52	4.18	1.42	1.19	9.69 (T)	13/12/94	0.56	2.2	60
K10	7.82	11.86	14.00	0.66	0.56	3.46 (N)	12/07/94	0.46	1.0	240
K11	4.43	7.37	8.97	0.60	0.49	3.47 (N)	13/07/94	0.75	3.0	120
K12	12.52	18.29	21.83	0.68	0.57	1.77 (K)	14/07/94	0.42	7.2	600
K13	9.65	15.68	18.14	0.62	0.53	1.76 (K)	15/07/94	0.45	6.7	180
K14a	1.50	3.87	4.77	0.39	0.31	0.396 (M)	09/08/94	0.49	0.7	2
K14b	1.50	1.59	1.97	0.94	0.76	0.494 (M)	10/08/94	0.44	1.0	2
K14c	0.75	1.18	1.40	0.63	0.54	0.396 (M)	09/08/94	0.93	0.9	2
H1	3.60	5.87	6.71	0.61	0.54	8.42 (T)	16/06/94	0.75	4.7	36
H2	4.10	5.07	6.26	0.81	0.66	6.48 (T)	10/07/94	0.52	20.8	120
E1	3.77	5.82	7.12	0.65	0.53	0.543 (B)	10/05/95	0.76	2.8	9
E2	3.48	6.97	8.13	0.50	0.43	0.551 (B)	11/05/95	0.79	3.0	6
E3	3.80	8.88	10.46	0.43	0.36	0.553 (B)	12/05/95	0.71	2.7	6
E4	2.95	5.59	6.86	0.53	0.43	0.535 (B)	13/05/95	1.01	5.1	5
E5	6.65	23.24	26.73	0.29	0.25	0.526 (B)	14/05/95	1.33	0.7	2
L1	4.78	3.64	4.61	1.31	1.04	1.76 (S)	09/12/94	0.63	3.3	48
L2	5.48	3.64	4.74	1.51	1.16	1.76 (S)	09/12/94	0.40	2.6	48

Note 1: (T) = Theale, (N) = Newbury, (K) = Knighton, (M) = Marlborough, (B) = Brimpton and (S) = Shaw

Note 2: Peak dye concentration following the subtraction of background levels.

Note 3: Assuming a 1.2g/cm³ density and a 20% solids (dye) content by weight.

TABLE 4b. Time of Travel Under Medium Flow Conditions

SECTION CODE	SECTION LENGTH (km)	FIRST ARRIVAL TIME (hours)	PEAK ARRIVAL TIME (hours)	FIRST ARRIVAL VELOCITY (Km/Hr)	PEAK ARRIVAL VELOCITY (Km/Hr)	FLOW AT GAUGING STATION (Cumeecs) (Note 1)	DATE	BACKGROUND READING (µg/l)	PEAK READING (µg/l) (Note 2)	DYE MASS (g) (Note 3)
K1	2.41	0.62	0.82	3.91	2.95	35.00 (T)	31/01/95	2.6	12.1	360
K2	2.64	0.76	0.95	3.48	2.78	35.00 (T)	31/01/95	2.7	12.1	240
K3a	1.28	0.25	0.31	5.12	4.16	39.90 (T)	02/02/95	4.0	7.0	24
K3b	1.63	0.40	0.53	4.08	3.08	33.60 (T)	03/02/95	2.6	5.8	60
K3c	0.63	0.08	0.13	7.59	4.74	33.60 (T)	03/02/95	2.6	11.0	12
K4	3.85	0.98	1.25	3.95	3.08	30.50 (T)	04/02/95	1.8	13.3	300
K5	4.54	1.45	1.75	3.13	2.59	30.50 (T)	04/02/95	1.6	3.4	240
K6	5.28	1.25	1.53	4.22	3.44	28.50 (T)	05/02/95	1.0	6.4	240
K7	4.78	1.40	1.73	3.41	2.76	28.50 (T)	05/02/95	1.0	7.6	240
K8	3.59	0.95	1.25	3.78	2.87	26.80 (T)	01/03/95	1.2	6.0	156
K9	4.99	1.56	1.97	3.20	2.54	26.80 (T)	01/03/95	0.5	5.4	156
K10	7.82	3.52	4.17	2.22	1.88	16.10 (N)	01/03/95	0.5	1.9	108
K11	4.43	2.33	2.85	1.90	1.55	14.90 (N)	05/02/95	0.7	3.4	114
K12	12.52	5.85	7.05	2.14	1.78	7.00 (K)	06/02/95	0.5	1.0	72
K13	9.65	4.25	5.37	2.27	1.80	7.07 (K)	08/02/95	0.5	1.9	96
K14	3.76	1.53	2.03	2.46	1.85	3.89 (M)	08/02/95	0.4	2.5	29
H1	3.60	2.90	3.43	1.24	1.05	35.00 (T)	31/01/95	2.9	17.6	120
H2	4.10	1.54	1.94	2.66	2.11	39.90 (T)	02/02/95	3.9	15.1	120
E1	3.77	2.07	2.53	1.82	1.49	3.34 (B)	07/02/95	0.9	6.0	25
E2	3.48	1.82	2.20	1.92	1.58	3.34 (B)	07/02/95	0.9	6.4	18
E3	3.80	3.22	3.82	1.18	1.00	3.34 (B)	07/02/95	0.9	6.1	18
E4	2.95	1.20	1.40	2.46	2.11	19.60 (B)	08/12/94	2.3	4.9	48
E5	6.65	2.32	2.72	2.87	2.45	19.60 (B)	08/12/94	2.4	10.0	120
L1	4.78	2.05	2.63	2.33	1.82	4.67 (S)	28/02/95	0.2	1.8	26
L2	5.48	2.60	3.05	2.11	1.80	4.67 (S)	28/02/95	0.1	1.4	23

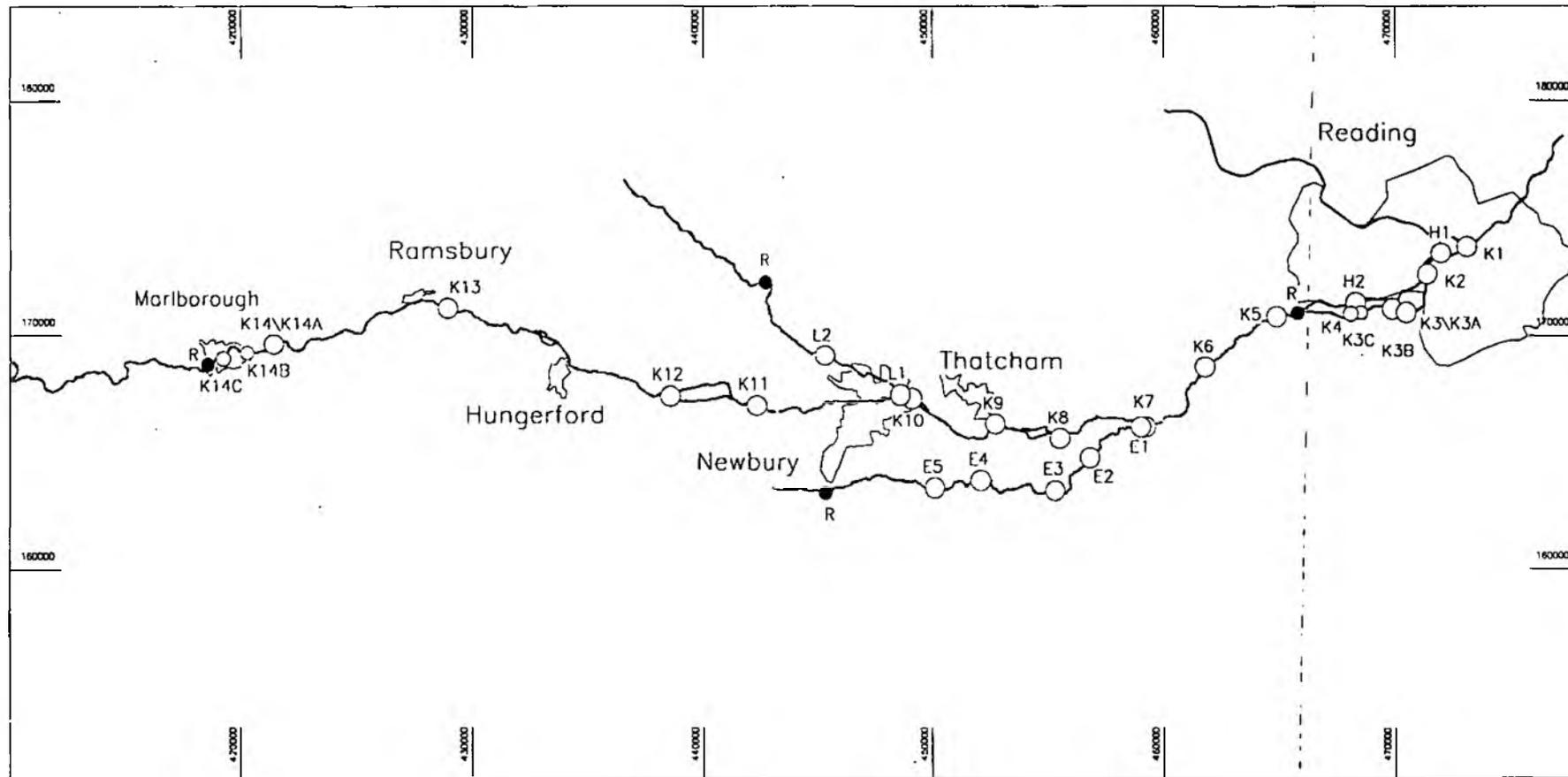
Note 1: (T) = Theale, (N) = Newbury, (K) = Knighton, (M) = Marlborough, (B) = Brimpton and (S) = Shaw

Note 2: Peak dye concentration following the subtraction of background levels.

Note 3: Assuming a 1.2g/cm³ density and a 20% solids (dye) content by weight.

TABLE 4c. Time of Travel Under High Flow Conditions

FIGURE



KILOMETRES



Kennet Catchment Time of Travel Studies
 Kennet Catchment
 Survey Area

NOTES

- Monitoring Point with Section Code
- R Furthest upstream release point

REFERENCE NO: C30020/1037

FIGURE NO: 1

DATE PLOTTED: 21-JUN-95



WIMPEY ENVIRONMENTAL



WIMPEY ENVIRONMENTAL

DATA LISTING

LOW FLOWS

MEDIUM FLOWS

HIGH FLOWS

Kennet

LOWK1.TXT
LOWK2.TXT
LOWK3A.TXT
LOWK3B.TXT
LOWK3C.TXT
LOWK4.TXT
LOWK5.TXT
LOWK6.TXT
LOWK7.TXT
LOWK8.TXT
LOWK9.TXT
LOWK10.TXT
LOWK11.TXT
LOWK12.TXT
LOWK13.TXT
LOWK14.TXT

MED_K1.TXT
MED_K2.TXT
MED_K3A.TXT
MED_K3B.TXT
MED_K3C.TXT
MED_K4.TXT
MED_K5.TXT
MED_K6.TXT
MED_K7.TXT
MED_K8.TXT
MED_K9.TXT
MED_K10.TXT
MED_K11.TXT
MED_K12.TXT
MED_K13.TXT
MED_K14A.TXT
MED_K14B.TXT
MED_K14C.TXT

HIGHK01.TXT
HIGHK02.TXT
HIGHK03A.TXT
HIGHK03B.TXT
HIGHK03C.TXT
HIGHK04.TXT
HIGHK05.TXT
HIGHK06.TXT
HIGHK07.TXT
HIGHK08.TXT
HIGHK09.TXT
HIGHK10.TXT
HIGHK11.TXT
HIGHK12.TXT
HIGHK13.TXT
HIGHK14.TXT

Holy Brook

LOWH1.TXT
LOWH2.TXT

MED_H1.TXT
MED_H2.TXT

HIGHH01.TXT
HIGHH02.TXT

Enborne

LOWE1.TXT
LOWE2.TXT
LOWE3.TXT
LOWE4.TXT
LOWE5.TXT

MED_E1.TXT
MED_E2.TXT
MED_E3.TXT
MED_E4.TXT
MED_E5.TXT

HIGHE01.TXT
HIGHE02.TXT
HIGHE03.TXT
HIGHE04.TXT
HIGHE05.TXT

Lambourn

LOWL1.TXT
LOWL2.TXT

MED_L1.TXT
MED_L2.TXT

HIGHL01.TXT
HIGHL02.TXT